CLAIMS

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What is claimed:

1	1. A method for correcting web deformation during a roll-to roll process
2	comprising:
3	initiating a roll-to-roll process involving a flexible web substrate;
4	detecting deformation in the flexible web substrate during the roll-to-roll process
5	and
6	dynamically aligning the flexible web substrate based on the detected
7	deformation.
1	2. The method of claim 1 wherein detecting deformation in the flexible web
2	substrate includes:
3	utilizing optical markings on the flexible web substrate to detect the deformation;
4	comparing the detected deformation with a desired deformation;
5	generating an error signal based on the comparison; and
6	generating a correction signal to be utilized to dynamically align the flexible web
7	substrate.
1	3. The method of claim 1 wherein dynamically aligning the flexible web
2	substrate includes:
3	utilizing controllable mechanical components to align the flexible web substrate
4	based on the detected deformation.

The method of claim 3 wherein the controllable mechanical components

2	include steerable disks.
1 2	5. The method of claim 3 wherein the controllable mechanical components include spherical nips.
1 2	6. The method of claim 5 wherein each spherical nip includes a spring loaded counter roller.
1 2	7. The method of claim 3 wherein the controllable mechanical components include mechanical cross-rollers.
1 2	8. A system for correcting web deformation during a roll-to roll process comprising:
3	means for initiating a roll-to-roll process involving a flexible web substrate; means for detecting deformation in the flexible web substrate during the roll-to-
5	roll process; and
6	means for dynamically aligning the flexible web substrate based on the detected
7	deformation.
1	9. The system of claim 8 wherein the means for detecting deformation in the
2	flexible web substrate includes:
3	means for utilizing optical markings on the flexible web substrate to detect the
4	deformation;
5	means for comparing the detected deformation with a desired deformation;

O	mea	ans for generating an error signal based on the comparison; and
7	mea	ans for generating a correction signal to be utilized to dynamically align the
8	flexible we	b substrate.
1	10.	The system of claim 8 wherein the means for dynamically aligning the
2	flexible we	b substrate includes:
3	mea	ans for utilizing controllable mechanical components to align the flexible web
4	substrate ba	ased on the detected deformation.
1	11.	The system of claim 10 wherein the controllable mechanical components
2	include stee	erable disks.
1	12.	The system of claim 10 wherein the controllable mechanical components
2	include sph	erical nips.
1	13.	The system of claim 12 wherein each spherical nip includes a spring
2	loaded cour	nter roller.
1	14.	The system of claim 10 wherein the controllable mechanical components
2	include med	chanical cross-rollers.
l	15.	A roll-to-roll processing system comprising:
2	a we	eb rolling mechanism;
3	a fle	exible web substrate coupled to the web rolling mechanism;

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4	a plurality of sensors configured to dynamically detect deformation in the flexible
5	web substrate;
6	at least one controllable mechanical component coupled to the flexible web
7	substrate; and
8	a computer system coupled to the plurality of sensors and the at least one
9	controllable mechanical component wherein the computer system includes logic for
10	detecting deformation in the flexible web substrate; and
11	dynamically aligning the flexible web substrate based on the detected
12	deformation.
1	16. The system of claim 15 wherein the logic for detecting deformations in
2	the flexible web substrate includes logic for:
3	utilizing optical markings on the flexible web substrate to detect the deformation;
4	comparing the detected deformation with a desired deformation;
5	generating an error signal based on the comparison; and
6	generating a correction signal to be utilized to dynamically align the flexible web
7	substrate.
1	17. The system of claim 15 wherein the logic for dynamically aligning the
2	flexible web substrate comprises logic for:
3	utilizing the at least one controllable mechanical component to align the flexible
4	web substrate based on the detected deformation.

The system of claim 17 wherein the at least one controllable mechanical

2 component includes steerable disks. 19. The system of claim 17 wherein the at least one controllable mechanical 1 2 component includes spherical nips. The system of claim 19 wherein each spherical nip includes a spring 20. 1 2 loaded counter roller. 1 21. The system of claim 17 wherein the at least one controllable mechanical component includes mechanical cross-rollers. 2 V 22. 1 A computer program product for correcting web deformation during a roll-to-roll process wherein the computer program product includes a computer usable 2 3 medium having computer readable program means for causing a computer to perform the steps of: 4 5 initiating a roll-to-roll process involving a flexible web substrate; 6 detecting deformation in the flexible web substrate during the roll-to-roll process; 7 and dynamically aligning the flexible web substrate based on the detected 8 deformation. 9 23. 1 The computer program product of claim 22 wherein detecting 2 deformation in the flexible web substrate includes: 3 utilizing optical markings on the flexible web substrate to detect the deformation:

4	comparing the detected deformation with a desired deformation;
5	generating an error signal based on the comparison; and
6	generating a correction signal to be utilized to dynamically align the flexible web
7	substrate.
1	24. The computer program product of claim 22 wherein dynamically aligning
2	the flexible web substrate includes:
3	utilizing controllable mechanical components to align the flexible web substrate
4	based on the detected deformation.
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1	25. A method for correcting web deformation during a roll-to roll process
2	comprising:
3	utilizing optical markings on a flexible web substrate to detect a deformation in
4	the flexible web substrate;
5	comparing the detected deformation with a desired deformation;
6	generating an error signal based on the comparison;
7	generating a correction signal to be utilized to dynamically align the flexible web
8	substrate and
€	dynamically aligning the flexible web substrate based on the correction signal.
1	26. The method of claim 25 wherein dynamically aligning the flexible web
2	substrate further comprises:
3	utilizing controllable mechanical components to align the flexible web substrate
1	based on the correction signal.

The method of claim 26 wherein the controllable mechanical components include steerable disks.

The method of claim 26 wherein the controllable mechanical components include spherical nips.

The method of claim 28 wherein each spherical nip includes a spring loaded counter roller.